

## Message Text

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ACTION INR-07

INFO OCT-01 EA-10 ISO-00 OC-05 CCO-00 CIAE-00 OTPE-00

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DEPT PASS DEPARTMENT OF COMMERCE, OFFICE OF  
TELECOMMUNICATIONS

E.O. 11652: N/A

TAGS: PINR, TECH

SUBJECT: FOREIGN SMALL EARTH-STATION TECHNOLOGY ASSESSMENT

REF: (A) STATE 282812, DEC 27, 74 (B) STATE 004295

(C) TOKYO A-584, SEPT 9, 74

SUMMARY: IN RESPONSE TO REQUEST OF REF A, INFORMATION IS PROVIDED  
ON JAPANESE DEVELOPMENTS IN FIELD OF SMALL EARTH-STATIONS.  
END SUMMARY.

1. REF (C) PROVIDED INFORMATION ON JAPANESE DEVELOPMENTS OF EARTH  
STATIONS FOR USE IN CONNECTION WITH JAPANESE BROADCAST  
SATELLITE, LAUNCHING OF WHICH HAS NOW BEEN DELAYED FROM FIRST  
QUARTER OF 1977 TO FIRST QUARTER 1978. EMBASSY BELIEVES OFFICE  
OF TELECOMMUNICATION WILL FIND THIS INFORMATION RESPONSIVE IN  
PART TO REQUEST OF REF A. FOLLOWING RECEIPT RF A, SCICOUNS  
HAS HELD FURTHER DISCUSSION WITH SAME OFFICIALS OF NHK (JAPAN  
BROADCASTING COMPANY) LABORATORY, WHO ARE FAMILIAR WITH OVERALL  
EARTH-STATION DEVELOPMENT PICTURE IN JAPAN. RESUME FOLLOWS:

2. BROADCAST SATELLITE (BS) GROUND

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STATION - SUPPLEMENTING INFO IN REF C, OFFICIALS

PROVIDED UPDATED DESCRIPTION OF 4.5 METER TRANSPORTABLE RECEIVER FOR OUTLYING ISLANDS, WHICH CONSTITUTES CURRENT THRUST OF BS GROUND STATION DEVELOPMENT. ANTENNA OF SHAPED REFLECT TYPE WILL BE STEERABLE BOTH HORIZONTALLY AND VERTICALLY, PLUS OR MINUS 5 DEGREES IN EITHER PLANE. STEERING CAN BE ACCOMPLISHED MANUALLY, AUTOMATICALLY, OR REMOTELY. (NHK EXPLAINED THAT 2.5 METER ANTENNA DIAMETER IS BREAK POINT FOR 12 GHZ FREQUENCY UTILIZED BY BS, WITH LARGER ANTENNA REQUIRING STEERING). ANTENNA WILL EMPLOY UNIFORM APERTURE ILLUMINATION WITH A SIDE-LOBE GAIN OF - 14 DB. CONTRACT FOR CONSTRUCTION OF A PROTOTYPE STATION HAS JUST BEEN AWARDED TO MITSUBISHI ELECTRIC CO. NHK ESTIMATES THE "MARKET" DURING THE EXPERIMENTAL PHASE OF THE BS PROGRAM AT 10-12 UNITS. STATION COST IS ESTIMATED AT \$100,000. IN COMMENTING ON DEVELOPMENT OF THIS STATION, NHK OFFICIALS REFERRED FAVORABLY TO HULETT-PACKARD ANTENNA FOR ATS-6 RECEPTION, WHICH THEY APPARENTLY SAW DURING RECENT US VISIT.

### 3. SMALL EARTH STATIONS FOR INTELSAT SERVICE

NHK OFFICIALS EXPLAINED THAT MARKET FOR LARGE-SCALE INTELSAT EARTH STATIONS NOW ESSENTIALLY SATURATED, SINCE COUNTRIES WITH HEAVY TRAFFIC HAVE ALREADY INSTALLED SUCH STATIONS. NHK UNDERSTANDS THAT INTELSAT HAS TAKEN ACTION TO RELAX OR REMOVE PREVIOUS PENALTIES ON SMALL ANTENNAS, THUS MAKING THESE PRACTICAL FOR INTELSAT APPLICATION. TWO JAPANESE MANUFACTURERS, BOTH ALREADY ACTIVE IN SUPPLYING LARGE-SCALE STATIONS, NEC AND MITSUBISHI ELECTRIC CO., ARE THEREFORE ACTIVELY DEVELOPING SMALL SCALE STATIONS.

4. MOST ADVANCED EFFORT IS APPARENTLY THAT OF NEC, WHICH ALREADY ENJOYS AROUND 2/3 OF WORLD EARTH-STATION MARKET. NEC HAS MANUFACTURED TRANSPORTABLE STATION EQUIPED WITH 10 METER DISH, WHICH WAS SENT TO PEKING TO PROVIDE INTELSAT HOOK-UP DURING PRIME MINISTER TANAKA'S VISIT TO PRC IN SEPTEMBER 1973. NHK UNDERSTANDS STATION STILL THERE, AND PRC HAS OR INTENDS TO BUY IT. THIS STATION, WHICH CAN BE CONSIDERED PROTOTYPE FOR NEC'S COMMERCIAL SMALL EARTH STATIONS, WAS SIMILAR TO NEC ASCOT, PHOTO OF WHICH IS CONTAINED IN ARTICLE ON SATELLITE COMMUNICATIONS IN MSN (A US ELECTRONICS PUBLICATION) OF APRIL/MAY 1974. ILLUSTRATED BROCHURE ON NEC'S SMALL STATIONS, WITH PERFORMANCE DETAILS, IS BEING POUCHED SEPARATELY TO OFFICE OF TELECOMMUNICATIONS.

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### GENERAL CHARACTERISTICS ARE:

TOTAL WEIGHT: LESS THAN 30 TONS

ANTENNA: 10 OR 13 METER

STEERABILITY: PLUS OR MINUS 4 DEGREES VERTICALLY TO 5 TO 90 DEGREES HORIZONTALLY

AMPLIFIER: TWO TYPES - HIGH POWER AND LOW NOISE

LOW NOISE AMPLIFIER G/T RATIO RANGES FROM 31.2

DB/K TO 35.8 DB/K FOR VARIOUS CONDITIONS.

5. MITSUBISHI PROGRAM FOR SMALL EARTH-STATION DEVELOPMENT IS PROBABLY LESS ADVANCED. MITSUBISHI IS OPERATING EXPERIMENTAL 12.8 METER DISH FOR DOMESTIC SATELLITE COMMUNICATIONS AT YOKOSUKA TEST STATION OF NTT (NIPPON TELEPHONE AND TELEGRAPH), BUT NHK OFFICIALS UNAWARE OF MARKETING EFFORTS SO FAR. THIS DISH, INCIDENTALLY, OPERATES OVER THE VERY WIDE FREQUENCY RANGE OF 40 TO 30 GHZ, AND MAY THEREFORE INDICATE MITSUBISHI INTEREST IN THE TREND TOWARDS HIGHER FREQUENCIES. TECHNICAL ARTICLE IN JAPANESE WITH ENGLISH ABSTRACT BEING FORWARDED OFFICE OF TELECOMMUNICATION.

6. OTHER SMALL-SCALE EARTH STATION EFFORTS IN JAPAN INCLUDE TWO 10 METER DISH-EQUIPPED STATIONS BEING PLANNED BY MINISTRY OF POSTS AND TELECOMMUNICATIONS (MOPT) FOR CONTROL OF BROADCAST SATELLITE AND COMMUNICATIONS SATELLITE NOW SCHEDULED FOR 1978 LAUNCHING, JAPAN METEOROLOGICAL AGENCY WILL PRESUMABLY INSTALL SIMILAR STATION FOR USE WITH GMS SATELLITE SCHEDULED FOR LATE 1977.

7. DEVELOPMENT OF DOMESTIC BROADCAST AND COMMUNICATIONS SATELLITE SYSTEMS, WHICH IS EVENTUAL GOAL OF CS AND BS PROJECTS, WOULD CREATE SIZEABLE JAPANESE MARKET FOR SMALL EARTH-STATIONS. IN EMBASSY VIEW, HOWEVER, SINCE BOTH THESE SYSTEMS WOULD BE OPERATED BY PUBLIC CORPORATIONS (NHK IN CASE OF BROADCAST (TV) SYSTEM, AND NTT IN CASE OF COMMUNICATIONS SYSTEM), IT WOULD BE SURPRISING IF US MANUFACTURERS COULD ENTER MARKET.

8. WHEN TIME PERMITS, EMBASSY PLANS FURTHER DISCUSSIONS THIS SUBJECT WITH POTENTIAL SUPPLIERS (NEC AND MITSUBISHI, WITH JMA, AND PERHAPS WITH MOPT AND WILL REPORT RESULTS WHEN AVAILABLE.  
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